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Observations of Occultations. By Rev. Leonard A. Williams, B.A.

(*Communicated by A. C. D. Crommelin.*)

First Series.

At Stoke Wake Rectory,
Blandford, Dorset.

Longitude, 2° 20′ 5″ W.
Latitude, 50 51 20 N.
Height above sea, 440 feet.

Star and Magnitude.		Disappearance G.M.T.		d	h	m	s
A Leonis	4·6	1905	May	12	8	44	27
γ Tauri	3·9		Sept.	19	10	35	40
Solar Eclipse—							
First con.			Aug.	29	23	45	19
Last con.				30	2	13	45

Second Series.

At Farningham Vicarage,
Dartford, Kent.

Longtitude, 0° 13′ 25″ E.
Latitude, 51 22 45 N.
Height above sea, 120 feet.

Star and Magnitude.		Disappearance G.M.T.		d	h	m	s
μ Ceti	4·4	1905	Dec.	8	5	34	26
χ Leonis	4·7	1906	April	6	7	3	27
o Sagittarii	3·9		Nov.	19	5	29	30
ξ^2 Ceti	4·3	1907	Jan.	21	9	5	9
ν Geminorum	4·1			26	6	39	55

Method of determining time.—At Stoke Wake: Equal altitudes with sextant, and artificial horizon (mercury). At Farningham: Meridian observations with transit instrument.

Chronometer.—Deck watch in box, No. 08354, by Frodsham. Rate per diem for Jan. 1907, $-·9^s$.

Results.—The times are not *guaranteed* to the exact second; but they are assumed, with good reason, to be correct to 1·5 seconds.

1907 *January* 30.

Appendix to the above Paper. By A. C. D. Crommelin.

I have reduced Mr Williams' observations in the same manner as the Greenwich observations of occultations. The R.A., N.P.D., and parallax of Moon have been interpolated with second differences from the Nautical Almanac, and the semidiameter found by the equation log semidiameter = log parallax + 9·43542, this being the constant to reduce to Struve's semidiameter 15′ 32″·65, which is now used at Greenwich in the reduction of occultations. The R.A. and N.P.D. of the stars are taken with the Nautical Almanac values of their mean places and star corrections.

Then assuming—

True Time of Phenomenon = Observed Time + t^s
,, R.A. of Moon = Naut. Alm. value $+ x'' + t \times$ mot$^{n.}$ in 1^s
,, N.P.D. . . . = ,, $+ y + t \times$ mot$^{n.}$ in 1^s
,, R.A. of Star = ,, $+ e$
,, N.P.D. . . . = ,, $+ f$
,, Parallax of Moon = ,, $\times \left(1 + \frac{m}{1000}\right)$
,, Semidiameter ,, = Naut. Alm. Par$^{x.}$ $\times ·272535 \times \left(1 + \frac{n}{1000}\right)$

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I have found the following equations of condition; in the case of occultations observed at Greenwich, the Greenwich value of Semid. − Distance is given for comparison :—

Date.	Semid.—calculated Distance. Williams.	Greenwich.	$=e\times$	$+f\times$	$+x\times$	$+y\times$	$+t\times$	$+m\times$	$+n\times$
1905 May 12	−7″·40		= +·77	+·62	−·77	−·61	−·43	− ·60	−·89
Sep. 19	−0·91		= +·11	−·99	−·11	+·99	−·19	+2·17	−·96
Dec. 8	−4·18		= +·78	−·61	−·78	+·61	−·42	+ ·04	−·88
1906 Ap. 6	−6·36	−7·81	= +·51	+·86	−·51	−·86	−·37	−2·97	−·97
Nov. 19	−2·33	−5·12	= +·92	+·18	−·92	−·18	−·46	+ ·69	−·99
1907 Jan. 21	−1·56		= +·99	+·05	−·99	−·05	−·36	+1·24	−·90
26	−3·20	−4·68	= +·87	+·37	−·87	−·37	−·35	−2·18	−·89

[The following were received too late for insertion in the Annual Report of the Council.]

Report of the Melbourne Observatory. (*Director Mr P. Baracchi.*)

The principal astronomical work done at this observatory during the year 1906 was limited, as in previous years and for the same reasons, to meridian observations and stellar photography, including the measurement of plates of the Sydney and Melbourne Zones, in regard to which a separate report is appended.

Meridian Observations.—These were made with the 8-inch Transit Circle, and were as follows :

	Observations in R.A.	Observations in N.P.D.
Clock Stars . . .	505	...
Azimuth Stars . . .	269	117
List Stars	1276	1289
Total .	2050	1406

The list stars were selected from the Melbourne plates of the Astrographic Catalogue, to serve as fundamental points of reference for the reduction of these plates.

The total number of this class of stars now completely observed not less than three times is 5545.

The reductions, including the preparation of the annual catalogue for 1905, are well advanced.

A general catalogue for the epoch 1900, including all stars observed since 1894, is in course of preparation.

No authority has yet been obtained for printing the general catalogue for the epoch 1890, the MS. of which was prepared some years ago.

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